

CLAIMS:

1. A heater having a durable construction for incorporation into a plurality of articles, said heater comprising:

at least one continuous heating means,

5 at least one continuous current leakage conductor,

at least one continuous NTC sensing means, placed between, and electrically connected to said heating means and said current leakage conductor, said NTC sensing means provides current leakage between said heating means and said current leakage conductor;

10 at least one controller, for simultaneous protection from hot spot and mechanical intrusion into said heater, said hot spot is detected by measuring the imbalance of electrical current flowing between live and neutral ends of the electrical circuit of said heating means;

2. A heater as defined in claim 1 further including at least one insulation means covering at least one side of combination of said heating means, said NTC sensing means and said current leakage conductor;

15 3. A heater as defined in claim 1 wherein said current leakage conductor is electrically connected to the ground.

4. A heater as defined in claim 1 wherein said current leakage conductor is electrically connected to one of the current supply conductors of said controller;

5. A heater as defined in claim 1 further including sensing means.

20 6. A heater as defined in claim 5 wherein said sensing means comprises PTC temperature sensing means with PTC detector.

7. A heater as defined in claim 1 wherein said at least one NTC sensing means, placed between, and electrically connected to a return conductor and said current leakage conductor.

8. A heater as defined in claim 1 wherein said heating means comprise a melting fuse, said
25 melting fuse comprising at least one electrically conductive textile fiber as a heating means, said at

least one electrically conductive textile fiber melts at a temperature above 110°C and below 350°C terminating electrical continuity in said heating means and preventing a fire hazard in said heating cable.

9. A heater as defined by claim 1, further including a visual indicator warning of hot spot on
5 said controller.

10. The heater as defined by claim 1, further including sound signal warning of hot spot in said heater.

11. A method of simultaneous protection by a controller from a hot spot and mechanical intrusion into said heater, recited in claim 1 comprises steps of:

10 leaking of electrical current between said heating means and said current leakage conductor,
through said NTC sensing means,

detecting an imbalance of electrical current flowing between live and neutral ends of the electrical
circuit of said heating means,

terminating of electrical continuity in said heater upon reaching predetermined current leakage

15 limiting setting.

12. A method of simultaneous protection by a controller as defined by claim 11, wherein said controller has separate said current leakage limiting settings for said hot spot and said mechanical intrusion in said heater.

13. A method of simultaneous protection by a controller as defined by claim 12, wherein the hot
20 spot current leakage limiting setting is lower than mechanical intrusion current leakage limiting setting.

14. A method of simultaneous protection by a controller as defined by claim 11, wherein said heater further comprising PTC temperature sensing means and PTC detector to control the maximum heating level in said heater.

15. A method of simultaneous protection by a controller as defined by claim 11, further including a visual indicator warning of hot spot on said controller.

16. A method of simultaneous protection by a controller as defined by claim 11, further including sound signal warning of hot spot in said heater.

5 17. A method of simultaneous protection by a controller as defined by claim 11 wherein said current leakage conductor is electrically connected to the ground.

18. A method of simultaneous protection by a controller as defined by claim 11 wherein said current leakage conductor is electrically connected to one of the current supply conductors of said controller;

10 19. A method of simultaneous protection by a controller as defined by claim 11, wherein said controller comprises ground fault circuit interrupter.

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